CLAIMS

1. Method for the manufacture of toner powder, wherein the individual toner particles (12) of the toner powder contain colorants incorporated into at least one polymer, in particular pigments, characterized in that as starter material of the polymer a liquid phase is provided based on a monomer and/or oligomer, the pigments are dispersed in said liquid phase, from the dispersion are produced extremely fine droplets (36) having a predetermined droplet size, and in the individual droplets (36) a polymerization reaction of the monomers and/or oligomers for formation of the polymer is caused by radiation of the droplets (36) with electro-magnetic waves or electrons, whereby the polymerized droplets (36) form the toner particles (12) of the toner powder.

2. Method according to Claim 1, characterized in that as starter material for the polymer monomers or oligomers are used based on acrylate, methacrylate and/or styrene, or on basis of polyester forming monomers and/or oligomers.

3. Method according to Claim 1 or 2, characterized in that load control agents are added to the fluid phase.

4. Method according to at least one of Claims 1 to 3, characterized in that surface-active additives, waxes and/or magnetite are added to the fluid phase.

5. Method according to at least one of Claims 1 to 4, characterized in that color substances are added to the fluid phase.

6. Method according to at least one of Claims 1 to 5, characterized in that the droplets (36) are expelled through jets (30) which according to the principle of an ink-jet, in particular with the aid of piezo-electrical converters (26, 32) or thermo-electrical converters, produce droplets (36) having a defined droplet size.

7. Method according to Claim 6, characterized in that a piezo-ink-jet print head (22) is used to generate the droplets (36).

8. Method according to Claim 6 or 7, characterized in that the droplet size of the droplets (36) is controlled by modulation of the energy supply of the piezo-electrical converters (26, 32) or of the thermo-electrical converters.

9. Method according to at least one of Claims 6 to 8, characterized in that the droplet expulsion per second and per jet (30) is adjusted to a range of 1 000 to 50 000 Hz.

10. Method according to at least one of the preceding Claims, characterized in that the droplets (36) are irradiated with UV-rays or with electron rays in order to cause the polymerization reaction in the droplets (36).

11. Method according to at least one of the preceding Claims, characterized in that the droplets (36) are charged electro-statically in order to prevent agglomerations.

12. Method according to Claim 11, characterized in that the electro-static charge during generation of the droplets (36) or immediately following generation of the droplets (36) is caused by establishment of an electrical field.

13. Method according to at least one of the preceding Claims, characterized in that the droplets (36), the partially hardened toner particles or the firm toner particles (12) are directed to a conveyor belt (38), moving at high speed, on which the polymerization reaction takes place, continues or is completed.

14. Method according to Claim 13, characterized in that the droplets (36) adhering to the conveyor belt (28) are irradiated with electro-magnetic waves.

15. Method according to Claim 13 or 14, characterized in that the conveyor belt (28), in case of electro-statically charged droplets (36) is charged with the opposite polarity vis-à-vis these droplet (36).

16. Method according to at least one of the preceding Claims, characterized in that the dispersion droplets (36) are hardened during their flight.

17. Method according to at least one of Claims 1 to 15, characterized in that the dispersion droplets (36) exiting from the droplet generator are put into a state of suspension and are hardened in said state of suspension.

18. Method according to at least one of the preceding Claims, characterized in that the droplet size is adjusted in such manner that the particle size of the obtained toner particles (12) lies between approximately 2 and 9 µm, in particular between approximately 4 and 7 µm.

19. Method according to at least one of the preceding Claims, characterized in that the liquid phase of the droplets produced prior to treatment with rays is adjusted to a viscosity of approximately 1 to 50 mPas, in particular of approximately 1 to 15 mPas.

20. System for the manufacture of toner powder, wherein the individual toner particles of the toner powder contain pigments incorporated in at least one polymer, characterized by a supply vessel for a dispersion of pigments in a liquid phase based on monomers and/or oligomers, which serve as starter materials for the polymer of the toner particles, a droplet generator (22) connected with the supply vessel (14) equipped with a multitude of jets (30) for generating extremely fine dispersion droplets (36) having a defined droplet size and a radiation device (40) for radiation of the dispersion droplets (36) generated by the droplet generator (22) with electro-magnetic waves or electrons.

21. System according to Claim 20, characterized in that the radiation device (40) irradiates the droplets (36) with UV-rays or electron rays.

22. System according to Claim 20 or 21, characterized in that each jet (30) of the droplet generator (22) is assigned a piezo-electrical or thermo-electrical converter (26, 32) and that the converters (26, 32) of the jets (30) are at least group-wise combined and connected with an electrical control for operation of

the converters (26, 32).

23. System according to Claim 22, characterized in that the droplet generator is a conventional ink-jet-print head (22).

24. System according to at least one of the preceding Claims 20 to 23, characterized by a mixing device connected with supply vessel (14) for dispersing the pigments in the liquid phase based on monomers and/or oligomers.

25. System according to at least one of Claims 20 to 24, characterized in that the droplet generator (22) sprays the droplets (36) onto a conveyor belt (38) moving at high speed past the jets (30).

26. System according to Claim 25, characterized in that the radiation device (40) is arranged along side the transport path of the conveyor belt (38) and irradiates the dispersion droplets (36) resting on the conveyor belt with electro-magnetic waves.

27. System according to at least one of Claims 20 to 25, characterized in that the radiation device (40) is arranged immediately behind the droplet generator (22) in order to irradiate the generated dispersion droplets (36) in flight or in a state of suspense.

28. System according to at least one of Claims 20 to 24, characterized in that the droplet generator expels the droplets in a closed radiation space into which the radiation device emits rays.

29. Toner powder with toner particles, obtainable according to a method in accordance with Claims 1 to 19.

30. Method for the production of toner powder, whose individual toner particles contain at least one colorant incorporated in a polymer, in particular pigments, which comprises the following steps:

as starter material is provided for the polymer a liquid phase based on at least one monomer and/or oligomer,

at least the one colorant is dispersed in the fluid phase, the dispersion is applied to a surface, the dispersion is hardened on the surface by means of the at least one monomer and/or oligomer and subsequently removed from the surface.

31. Method according to Claim 1, characterized in that the liquid phase contains at least one solvent which is at least partially evaporated during hardening.

32. Method according to Claim 1 or 2, characterized in that an application thickness of the dispersion is selected having the size of a particle diameter of the toner powder to be produced, whereby in particular the application thickness is smaller than twice the particle diameter.

33. Method according to Claim 31 or 32, characterized in that the dispersion in essence is applied over the entire surface and after removal from the surface, comminution takes place, in particular by means of grinding.

34. Method according to at least one of Claims 30 to 32, characterized in that the dispersion is applied, in essence, on the surface in the form of isolated droplets whereby an average droplet diameter is selected having the size of a particle diameter of the toner powder to be produced, in particular smaller than twice the particle diameter.

35. Method according to at least one of the Claims 30 to 34, characterized in that the isolated droplets are expelled by jets which function according to the principle of an inkjet print head, based in particular on piezo- or thermo-electrical converters.

36. Method according to at least one of Claims 30 to 35, characterized in that the dispersion is hardened under addition of energy, in particular under the effect

of radiation.

37. System for the production of toner powder, wherein the individual toner particles of the toner powder contain colorants incorporated into at least one polymer, in particular pigments, comprising a supply vessel (14) for a dispersion (21,22) of colorants, in particular pigments, in a fluid phase based on monomers and/or oligomers, which serve as starter materials for the polymer of the toner particles, a surface (31) onto which the dispersion (21,22) can be applied for hardening by means of polymerization, means (61, 62) connected with the supply vessel (1) for applying the dispersion (21, 22) onto the surface (31) and means (8) for removal of hardened dispersion (23, 24) from the surface (31).

38. System according to Claim 37, characterized by means (5, 51, 51) for acceleration of the hardening.

39. System according to Claim 37 or 38, characterized in that the means for application of the dispersion onto the surface comprise a multitude of jets generating extremely fine droplets, in particular having a predetermined drop size.

40. Toner powder with toner particles, obtainable according to a method according to one of Claims 30 to 36.

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